REMARKS/ARGUMENTS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1-2, 4-6, and 8-9 are currently pending, Claims 1, 5, and 9 having been amended. The changes and additions to the claims do not add new matter and are supported by the originally filed specification, for example, on page 3, lines 21-24; page 22, lines 20-21; page 25, lines 17-18; and Fig. 1.

In the outstanding Office Action, Claims 1, 5, and 9 were rejected under 35 U.S.C. §103(a) as being unpatentable over Soltz (U.S. Patent No. 4,397,194) in view of Takeda et al. (JP Appl. No. 2001-329654, hereafter "Takeda I") and Takeda et al. ("Flow mapping of the mercury flow," hereafter "Takeda II"); and Claims 2-4 and 6-8 were rejected under 35 U.S.C. §103(a) as being unpatentable over Soltz in view of Takeda I, Takeda II, and Huang (U.S. Pub. No. 2002/0011120).

Applicants thank the examiner and his supervisor for the courtesy of an interview extended to Applicants' representative Sameer Gokhale on February 25, 2009. During the interview, the differences between the claims and the applied art were discussed. Additionally, clarifying claim amendments were also discussed.

Applicants also thank the examiner for the courtesy of a telephone interview with Mr. Gokhale on March 3, 2009. During the telephone interview, the examiner and Mr. Gokhale discussed proposed amendments to Claim 1 which were similar to those discussed during the interview of February 25, 2009. The examiner agreed that the amendments appear to overcome the applied art. Amendments and arguments similar to those discussed during both of the above-mentioned interviews are presented below.

With respect to the rejection of Claim 1 under 35 U.S.C. §103(a), Applicants respectfully submit that the amendment to Claim 1 overcomes this ground of rejection. Amended Claim 1 recites, *inter alia*,

> wherein a distance from the ultrasonic transducer in a direct line to the outer surface of the fluid pipe contacting the wedge is made longer than a distance obtained from multiplying a velocity of the ultrasonic wave penetrating through the wedge by a time of dead zone that an ultrasonic oscillator of the ultrasonic transducer carries,
>
> and the wedge and the outer surface of the pipe wall are separate elements such that the outer surface of the pipe wall forms an incidence point for an ultrasonic wave transmitted from the ultrasonic transducer.

Applicants respectfully submit that Soltz, Takeda I, Takeda II, and Huang fail to disclose or suggest at least these features of amended Claim 1.

Soltz is directed to an ultrasonic flowmeter which includes a method of measuring pipe geometry. Fig. 2 of Soltz shows the embodiment relied upon in the Office Action, which includes transducers 11 and 12, wedge 16, and pipe 10. Soltz shows that an ultrasonic pulse is transmitted through wedge 16 and travels along a path d1 which is reflected on the far side of the pipe 10 (see col. 5, lines 20-24). Soltz also describes that an ultrasonic pulse is reflected at the near pipe wall at point I and follows a path WP1 within the wedge, and then an echo is produced at point A at the interface of the inner surface of the pipe and the fluid (see col. 5, lines 43-47).

During the interview, with regard to the previously recited feature of "a distance from the ultrasonic transducer to the outer surface of the fluid pipe contacting the wedge is made longer than a distance obtained from multiplying a velocity of the ultrasonic wave penetrating through the wedge by a time of dead zone that an ultrasonic oscillator of the ultrasonic transducer carries," the examiner explained how he found this feature inherent in Soltz.

In the Advisory Action of January 28, 2009, the examiner relied on the following definition of "dead zone":

> "In ultrasonic testing, the interval following the initial pulse where the transducer ring down prevents detection or interpretation of reflected energy (echoes). In contact ultrasonic testing, the area just below the surface of a test object that can not be inspected because of the transducer is still ringing down and not yet ready to receive signals."

Thus, the dead zone corresponds to the distance extending from a transducer to which it cannot detect a reflection off an object. Therefore, Applicants submit that in order for Soltz to inherently have the distance from a transducer to the outer surface of a fluid pipe longer than the dead zone distance of the transducer, then Soltz must be detecting a reflection of an object at the distance from the transducer to the fluid pipe or closer. During the interview, the examiner indicated that in Fig. 2 of Soltz, although the transducer 12 measures a reflection off of the far side of the pipe, transducer 11 also measures the reflection off of point A on the near side of the pipe for measuring the geometry of the pipe (see col. 5, lines 42-46). Thus, although, the pulse from transducer 11 to point A takes an indirect path through wedge 16, the examiner broadly interpreted "a distance" in Claim 1 to read on this indirect path.

However, amended Claim 1 clarifies that "wherein a distance from the ultrasonic transducer ***in a direct line*** to the outer surface of the fluid pipe contacting the wedge is made longer than a distance obtained from multiplying a velocity of the ultrasonic wave penetrating through the wedge by a time of dead zone that an ultrasonic oscillator of the ultrasonic transducer carries." Applicants submit that this feature is not inherent in Soltz because the transducer of Soltz in Fig. 2 does not measure a reflection at the outer surface of the fluid pipe in a direct line. Therefore, Soltz fails to disclose or suggest this feature.

Furthermore, during the interview, with regard to the feature of "the transducer is fixed on the wedge such that at the prescribed frequency a distance of wave propagation from said ultrasonic transducer to an outer surface of the fluid pipe is an integral multiple of a half-wave length of an ultrasonic wave incident into the fluid to be measured," the examiner explained how he found this feature in the combination of Soltz and Takeda.

Takeda II is directed to a method of mapping a mercury flow contained in a stainless steel wall using an ultrasonic velocity profile (UVP). Takeda II describes the characteristics of transmission of ultrasound in various materials (see Section 2.1). Takeda II describes that maximum transmission of an ultrasonic wave occurs at $d/\lambda = n/2$, where n is an integer. (See Section 2.1, Equation (2)).

However, Page 161-162 and Equation 2 of Takeda II describes only the ***wall thickness*** (see page 161, section 2.1 for example). Therefore, Takeda II does not explicitly teach "the distance of wave propagation from said ultrasonic transducer to the outer surface of the fluid pipe," (such as "L x 1" in Applicants' Fig. 1). During the interview, the examiner indicated that while Takeda II only discloses maintaining integral multiples of a half-wave length for an ultrasound wave within a wall of a structure having a wall thickness *d*, he interpreted that the combination of a wedge and the pipe in Soltz can be regarded as a single wall element such that Takeda II teaches using integral multiples of a half-wave length through both the wedge and the pipe wall of Soltz.

However, amended Claim 1 clarifies that "the wedge and the outer surface of the pipe wall are separate elements such that the outer surface of the pipe wall forms an incidence point for an ultrasonic wave transmitted from the ultrasonic transducer." Therefore, amended Claim 1 explicitly defines that the combination of a wedge and pipe are different than a single wall material as described in Takeda II.

Thus, a person of ordinary skill in the art would not learn from Takeda II to modify Soltz such that "the transducer is fixed on the wedge such that at the prescribed frequency a distance of wave propagation from said ultrasonic transducer to an outer surface of the fluid pipe is an integral multiple of a half-wave length of an ultrasonic wave incident into the fluid to be measured," wherein "the wedge and the outer surface of the pipe wall are separate elements such that the outer surface of the pipe wall forms an incidence point for an ultrasonic wave transmitted from the ultrasonic transducer."

Therefore, Applicants respectfully submit that the combination of Takeda II and Soltz fails to disclose or suggest all the features of amended Claim 1 as discussed above.

Takeda I and Huang have been considered but fail to remedy the deficiencies of Soltz and Takeda II with regard to Claim 1.

Thus, for all of the above reasons, Applicants respectfully submit that amended Claim 1 (and all associated dependent claims) patentably distinguishes over Soltz, Takeda I, Takeda II, and Huang, either alone or in proper combination.

Amended independent Claims 5 and 9 recite features similar to those of amended Claim 1 discussed above. Thus, for all of the above reasons, Applicants respectfully submit that Claims 5 and 9 (and all associated dependent claims) patentably distinguish over Soltz, Takeda I, Takeda II, and Huang, either alone or in proper combination.

Consequently, in light of the above discussion and in view of the present amendment, the outstanding grounds for rejection are believed to have been overcome. The present application is believed to be in condition for formal allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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